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Presents the slides and text of an informal briefing given at HQ AFSC in June 1979. Outlines the current status of RPN 3702, "Air Force Acquisition Options for the 1980s," puts this project in the context of previous Rand work, and describes study plans. Emphasis is on how to acquire weapon systems, not what systems to acquire. 13 pp. (ED)

Mr. Faragher

ADA073510

N-1241-AF

July 1979

AIR FORCE ACQUISITION OPTIONS FOR THE 1980s: A BRIEFING ON STUDY PLANS

Giles K. Smith

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# A Rand Note

prepared for the

## United States Air Force

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SANTA MONICA, CA. 90406

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PREFACE

Earlier this year the Air Force Advisory Group (AFAG) for Project AIR FORCE formally approved a new Rand study of weapon systems acquisition with emphasis on problems of concern to the Air Force Systems Command (AFSC). Work on this project is now fully under way. On 20 June 1979 an informal briefing was presented to several audiences at Hq AFSC with the objective of summarizing the present status of the work and study objectives for the future. This text and the accompanying charts summarize that briefing.

This Note was prepared under the Project AIR FORCE project "Air Force Acquisition Options for the 1980s."

# OBJECTIVES

- EXAMINE ALTERNATIVE ACQUISITION STRATEGIES
  - HOW, NOT WHAT, TO DEVELOP
- FOCUS ON POLICY LEVEL ISSUES FOR MAJOR SYSTEMS
  - PRACTICAL IMPLEMENTATION
  - PROCEDURES AND INSTITUTIONS

CHART 1

The focus of the project is on broad acquisition strategies and procedures. We are concerned with questions of *how* to acquire weapon systems, as distinct from the question of *what* weapon systems should be acquired. Furthermore, we are chiefly concerned with broad policy issues rather than procedural details. However, effective policy must also be compatible with the existing institutions and administrative procedures, and therefore some questions of detail will inevitably arise in the course of the study.



## RELATED RAND STUDIES

### ● EARLIER STUDIES

- SYSTEM ACQUISITION STRATEGIES REVIEW (R-733)
- LONG-RANGE DEVELOPMENT PLANNING IN THE AIR FORCE (R-1989)
- RISK ANALYSIS FOR TURBINE ENGINES (R-2103)
- RELIABILITY IMPROVEMENT WARRANTIES (R-2264)
- QUANTITY-QUALITY TRADEOFFS IN AIR COMBAT (R-1976)
- COMPETITION IN ACQUISITION: LEGISLATIVE PERSPECTIVES (R-2058)
- ADEQUACY OF INDUSTRIAL BASE (R-2360)

### ● WORK IN PROGRESS

- SPACECRAFT ACQUISITION STRATEGIES (to be pub.)
- ACQUISITION EXPERIENCE OF THE 1970s (to be pub.)(DR&E)
- TECHNOLOGY TRENDS IN FIGHTER AIRCRAFT (to be pub.)
- USE OF PROTOTYPES IN ACQUISITION (report being written)
- EVALUATION OF PHASED ACQUISITION
- MULTINATIONAL DEVELOPMENT (DR&E)
- CO-NATIONAL PRODUCTION
- ACQUISITION OPTIONS FOR FIGHTER AIRCRAFT (AF/XO)
- LIFE CYCLE ANALYSIS METHODS
- COMPUTER RESOURCE REQUIREMENTS MANAGEMENT

CHART 2

Chart 2 identifies the topics or themes of a number of earlier Rand studies and some currently in progress, and gives some idea of the scope and nature of Rand's acquisition policy studies. It should be noted that some of our acquisition studies are funded by clients other than the Air Force (OSD and DOE being principal supporters). The Project AIR FORCE work frequently benefits from the data accumulation and findings of such studies.

# STUDY PLAN

## ● CURRENT WORK

- PROTOTYPE STUDY
  - BRIEFING, FINAL REPORT
- TECHNICAL RISK ANALYSIS
  - BRIEFING, FINAL REPORT
  - EXTEND METHODOLOGY
- PHASED ACQUISITION STUDY
  - MID-TERM REPORT
  - CONTINUE RESEARCH

## ● FUTURE STARTS

- PRODUCT IMPROVEMENT OPTIONS
  - ANALYZE COST, PERFORMANCE TRADEOFFS
  - DESIGN FOR IMPROVABILITY
- ANALYSIS OF MAJOR POLICY ALTERNATIVES
  - SURVEY ISSUES
  - RECOMMEND POLICY CHANGES

### CHART 3

The *study plan* summarizes the work proposed for the present study. The three items listed under *current work* represent study topics that were started under an earlier project conducted for Project AIR FORCE. For administrative convenience the final phases of the study on prototyping are being completed under the present project. A final briefing will be made available later this year. Similarly, work on technical risk analysis has been underway at Rand for several years. Results of our recent work are now ready for briefing and the summary report on recent research is in the publications pipeline, but we also expect to continue exploration of the topic as part of the present project. The third topic, phased acquisition, is also at a watershed. Next month we will be giving a progress briefing on that topic to AFSC, describing our results to date and discussing its implications for Air Force acquisition policy.

During the second half of this calendar year we expect to start work on two additional topics. The first, called *product improvement options*, is rooted in two observations. First, that weapon systems being produced today are likely to stay in the inventory for many years, and that they will inevitably undergo many modifications to update their capabilities in response to changes in threat and new technological opportunities. In many instances, making provision for such extensive modifications should be an explicit part of the initial development phase of our major system. Our second observation is that building new systems on existing systems is often both more effective and more efficient than repetitively starting "all new" system developments. That strategy is only selectively applicable to Air Force needs, and the conditions of its relevance have not been sufficiently defined. In this research we expect to analyze the feasibility of anticipating future modifications and system growth opportunities and the possible cost and performance consequences of incorporating those anticipations in the initial design. Finally, the long-term goal of the project is to conduct an analysis of *major policy alternatives*. That work is expected to become dominant next year as we accumulate more information on the phased acquisition and product improvement ideas.

## **SOME ACQUISITION ISSUES**

- ACQUISITION TIME-COST-RISK BALANCE
  - Estimation
  - Control (test design, phasing)
  - Parallel starts, prototypes
- PRODUCT IMPROVEMENT OPTIONS
  - Lifetime Expectations
  - Design for Modification
- USES OF COMPETITION
  - Policy/Implementation
  - Development vs. Production
  - DR&E Study
- QUANTITY-QUALITY
  - Option Generation
  - Vehicle vs. Munitions, Training, Support
- FOREIGN SALES, COOPERATIVE ACQUISITION
  - Good for USAF?
  - Best use?
- COMPONENT VS. SYSTEM DEVELOPMENT
  - Building Blocks
  - Standard Interfaces
  - Performance/Cost Effect

CHART 4

Throughout this project, we will have to focus our attention on only a few of the major acquisition issues facing the Air Force today. To guide us in selecting among these issues as our study evolves, we expect to have a continuing series of conversations with people here at AFSC Headquarters as well as in the product divisions and elsewhere in the Air Force. As an initial step toward such a series of conversations, I have prepared a short list of some of the major acquisition issues that appear current today. Chart 4 lists half a dozen such issues, all of which have at some time been the subject of Rand research. The prototyping, technological risk, and phased acquisition studies all fit under the first topic: acquisition time-cost-risk tradeoffs. The second item, *product improvement options*, is the new start that I noted on the previous chart. The last four topics are being examined in the course of other research now in progress at Rand.

## **SOME ACQUISITION ISSUES (Con't)**

- **CONTRACT TYPES**
  - Importance?
  - Fixed Price
  - Warranties
- **MANAGEMENT PRACTICES AND INCENTIVES**
  - Industry Methods
  - Short-vs. Long-Term
- **BUDGET PROCESS**
  - Importance?
  - Stability
  - Preferred Forms
- **MANUFACTURING TECHNOLOGY**
  - Cost Reduction
  - Design Transfer
- **INDUSTRY STRUCTURE AND PRACTICE**
  - Excess Capacity?
  - Separate Design and Production
  - Foreign Competition
- **INSTITUTIONAL FACTORS**
  - Policy vs. Implementation
  - Product Divisions
  - Distribution of Responsibility
  - Joint Service Planning

CHART 5

Chart 5 identifies some half dozen issues that we believe to be important to the Air Force, and particularly to AFSC, but that are not the subject of current or planned research at Rand. Some of these issues, such as the effect of different contract types and possible improvements in manufacturing technology, are of intense concern to AFSC today. We are interested in the extent to which AFSC would like to see Rand associate these topics with our ongoing work under the present project.



# ACQUISITION POLICY ANALYSIS

- WHAT IS A "GOOD" ACQUISITION PROGRAM?

- SURVIVAL TO COMPLETION

- ADHERENCE TO PLAN

- COST

- SCHEDULE

- PERFORMANCE

- OPERATIONAL SUITABILITY

- MEASUREMENT OF POLICY EFFECTIVENESS

- POOR DATA

- MULTIPLE INFLUENCES

- SUBTLE CAUSE-EFFECT RELATIONSHIPS

CHART 6

This last chart identifies two very broad and troublesome aspects of acquisition policy analysis. The first is that we do not have a good measure of what constitutes a desirable acquisition program outcome as opposed to an undesirable one. This makes it difficult to evaluate a particular acquisition strategy or tactic and decide whether or not it benefited or hampered a project in which it was tried. For this reason, we are unlikely to produce study results that conclusively demonstrate that one particular acquisition policy or tactic is likely to be "successful" or not. Instead, we want to examine the likely effects of alternative tactics, and then, in cooperation with Air Force people, determine the preferred application of those tactics.

A second problem is that because systematic and thorough acquisition research is not widespread, and because each one of our projects is in certain respects unique, we begin each new project with little relevant information in hand. This phenomenon is particularly important to our ongoing study; we expect to spend a substantial part of our effort during the next two or three years in collecting information on current and recent acquisition programs in an effort to sort out the cause-effect relationships between acquisition tactics, procedures, and program outcomes. From time to time we will be requesting your assistance in gaining access to elements of the necessary data.

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